

REMARKS/ARGUMENTS

Applicant appreciates the Examiner's continued thorough search and examination of the present patent application.

Claim 1 has been amended for clarity. Applicant respectfully submits that the changes to claim 1 make explicit that which Applicant believed was already implicit and, accordingly, do not narrow the scope of claim 1 and are not made for statutory purposes related to patentability.

Claims 1-39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Barrus et al. ("Barrus," U.S. Patent No. 6,058,397) in view of Mitchell et al. ("Mitchell," U.S. Patent No. 6,349,301). Applicant respectfully traverses this rejection.

Applicant's amended claim 1 is directed to a system to "interactively access and analyze temporal relationships that change over time," and includes "one or more 4D portal storage mediums containing 4D portal information." The 4D portal information represents "at least three spatial dimensions and a time dimension." Further, Applicant's claim 1 includes "one or more 4D browser programs adapted to access the one or more 4D portal storage mediums and convert the 4D portal information contained therein into one or more 4D objects to be rendered in a 3D scene." The one or more 4D browser programs are further adapted to "use the 4D portal information to render and manipulate at least one of temporal and spatial manifestations of the 4D objects independent of the 3D scene." Additionally, the one or more 4D browser programs of Applicant's claim 1 are further "adapted to enable a user to simulate traveling back and forth through the time dimension of a 4D portal." Applicant's claim 1 further provides for "one or more 4D portal windows adapted to receive and display the 4D objects in the 3D scene." The cited prior art does not teach, suggest or disclose these features, either alone or in combination.

In a non-limiting example and in accordance with an example embodiment of Applicant's claim 1, a 4D object representing a tree is not just a 3D model shaped like a tree. Instead, and in contrast to a 3D tree model created or modified by a 3D author, the present invention allows a user to see how the 4D object changes over time, e.g., the 4D tree object may grow over time, sway with the wind, change color and drop its leaves with the seasons in response to dynamically changing attributes defined in 4D portal information, including information representing the time dimension of the 4D object. The 4D tree object can be rendered and manipulated independent of

a 3D scene, for example a public park where the tree is located. Applicant respectfully submits this is not taught or suggested by the references, either alone or in combination.

In another non-limiting example, 4D portal information representing train schedules may indicate that a specific train (rendered as a 4D object) arrives at a train station each day at the same time. In accordance with claim 1 of Applicant's invention, the user, for example, is able to simulate traveling back and forth in time, and can, thus, render the 4D train object arriving at the train station each day at the appropriate time. In accordance with Applicant's claim 1, the 4D object of the train is manipulated by the one or more 4D browser programs using the three spatial dimensions and the time dimension defined in the 4D portal information. Neither Barrus nor Mitchell teach or suggest the features above, either alone or in combination.

Barrus is cited by the Examiner for disclosing the elements of Applicant's independent claim, except that Barrus fails to disclose a portal. More particularly, Barrus is cited for disclosing the "creation of a 3D environment which is created and modified as records in a database, i.e., storage medium." Further, the Examiner states that Barrus discloses a "3D database [that] includes a parts list, and ... a creation and modification date." Barrus is further cited for disclosing the "exchange of information between a browser and a server," and for disclosing "transformations, i.e., manipulations, of the object in a locale coordinate system, spatial dimension and ... further disclose [a] version list."

Applicant respectfully submits that Barrus does not teach or suggest "one or more 4D browser programs" adapted to access "4D portal storage mediums and convert the 4D portal information into one or more 4D objects." As noted above, Applicant's 4D objects are converted from "4D portal information" and are rendered and manipulated using "at least one of a temporal and spatial manifestation of the one or more 4D objects independent of the 3D scene." This is fundamentally different from Barrus, which cannot render 4D objects independent of a 3D scene. Instead, Barrus discloses use of a 3D environment combined with a time stamp, such as a creation and/or modification date that is commonly used for version control, to render 3D scenes.

Applicant submits that the system in Barrus is 3D model-centric. Barrus creates his 3D environment database by dividing it up and defining each database record as some geometric piece of a 3D model (col 2, line 50). Applicant's 4D browser, in contrast, renders 4D objects using "4D portal information" (i.e., using data representing "at least three spatial dimensions and

a time dimension”) to “render and manipulate” 4D objects “independent of 3D scene.” Barrus, in contrast, teaches that a changing sequence of parts can only be viewed by extracting all versions of the 3D model and displaying them side-by-side (col 15, lines 27-29). Unlike Applicant’s claim 1, Barrus requires 3D models, and does not define or manipulate 4D objects independent of a 3D scene. Further, Barrus’s use of version control is distinct from Applicant’s “4D portal information” that represents “at least three spatial dimensions and a time dimension.”

The Examiner cites to Mitchell for disclosing a portal. The Examiner states that Mitchell discloses a portal “as a doorway that links rooms and enables object movement between the rooms.” The Examiner concludes that it would have been obvious to one skilled in the art at the time of the invention “to include in the creation and modifications of the virtual environment created by Barrus, the portal information disclosed in Mitchell to allow for the user to manipulate objects through movement and portals [that] are used in virtual worlds to link movement locations and the updating of the client database with all of the information to portray objects represented in the new location.”

Applicant respectfully submits that Mitchell does not teach or suggest a 4D portal, as defined in Applicant’s claim 1, and, does not teach, suggest or disclose elements of Applicant’s claim 1 that are missing from the teachings of Barrus.

Mitchell defines a portal as a “doorway” that links rooms together and enables the movement of objects there-between (column 5, lines 22-26). Mitchell’s portal is used to change a user’s perspective from one room to another, encapsulating all the objects within the user’s new locale. Mitchell defines a room as an object that defines a discrete region of the virtual (3D) world where all potential perception between other objects disposed in that region is contained (see column 5, lines 3-5). This is patentably distinct from Applicant’s claim 1. Unlike Mitchell, Applicant’s claim 1 defines one or more 4D browser programs that are adapted “to enable a user to simulate traveling back and forth through time “of a 4D portal”. This feature is not taught or suggested by Mitchell.

Therefore, even assuming, *arguendo*, that one were to combine the teachings of Mitchell and Barrus, Applicant’s invention is not rendered obvious because the combined teachings Mitchell and Barrus do not provide the above-identified elements of Applicant’s claim 1, including “one or more 4D browser programs” adapted to “manipulate at least one of a temporal

and spatial manifestation of ... one or more 4D objects” of [a] 3D scene,” as defined in Applicant’s claim 1.

For the reasons set forth above, Applicant respectfully submits that independent claim 1 is patentable over the references cited.

Claims 2-31 are patentable for the same reasons, and because they include features which in combination with the claim(s) from which they depend are not taught, suggested or disclosed in the prior art.

Independent claim 32 is directed to a method for “generating a temporally and spatially manipulatable 4D portal from one or more information databases” in which “one or more 4D objects in a 3D scene” is created based on “4D object definitions.” Applicant respectfully submits that, as noted above with respect to 4D portal information, “4D objects” include information in a fourth dimension (time), for example annual tree growth or train schedules as per the examples described above, that is not defined in the three dimensions of a 3D environment with or without 3D model version control.

As with claim 1, the Examiner cites to the combined teachings of Barrus and Mitchell as rendering claim 32 obvious. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to include in the creation and modifications of the virtual environment created by Barrus, the portal information disclosed in Mitchell to manipulate objects through movement and portals that are used in virtual worlds as defined in Applicant’s claim 32. Applicant respectfully disagrees.

Barrus does not teach or suggest “4D object definitions” as defined in claim 32. Instead, Barrus teaches the use of a 3D model with a version control time stamp, and that 3D models are created and positioned by a 3D author. A 3D model with a version control time stamp differs significantly from “organizing 4D object types and spatial manifestations into a set of 4D object definitions, creating a 3D visual model for each 4D object type, and creating one or more 4D objects in a 3D scene based on the 4D object types” as defined in claim 32. Furthermore, Applicant submits that Barrus teaches a database that corresponds to a 3D scene (see Fig. 13), with no 4D object definitions as defined in claim 32. Thus, Applicant respectfully submits that Barrus does not teach or suggest generating a temporally and spatially manipulatable 4D portal, as defined in claim 32.

Applicant respectfully submits that Mitchell does not provide the necessary elements of claim 32 that are neither taught nor suggested by Barrus. Even assuming, *arguendo*, that one were to combine the teachings of Barrus and Mitchell, Applicant's claim 32 is still not rendered obvious. This is because the combined teachings of Mitchell and Barrus do not show a "creating one or more 4D objects in a 3D scene based on ... 4D object definitions." Therefore, Applicant respectfully submits that claim 32 is patentable over the combination of Barrus and Mitchell.

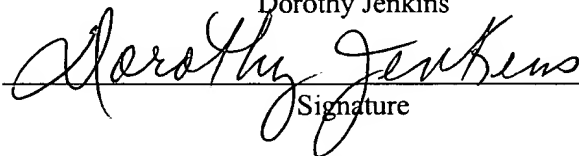
Claims 33-39 are patentable for the same reasons, and because they include features which in combination with the claim(s) from which they depend are not taught, suggested or disclosed in the prior art.

For the foregoing reasons, Applicant respectfully submits that the application is in condition for allowance, for which action is earnestly requested.

EXPRESS MAIL CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail to Addressee (mail label #EV343686235US) in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on July 6, 2004:

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Signature

July 6, 2004

Date of Signature

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Respectfully submitted,



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